

# Unit 1 Test Study Guide

(Algebra Basics)

Name: \_\_\_\_\_

Date: \_\_\_\_\_ Block: \_\_\_\_\_

## The Real Number System

List ALL sets to which each number belongs. (Use R, I, Q, Z, W, N)

1. $-\frac{14}{2} = -7$ R, Q, Z	2. $\sqrt{64} = 8$ R, Q, Z, W, N	3. 0 W, Z, Q, R
4. $\pi$ R, I	5. $0.\overline{45}$ R, Q	6. $\frac{3}{8}$ R, Q

Place the LETTER of each value its location in the real number system below.

<p>A. <math>-0.\overline{2}</math>      B. 18</p> <p>C. <math>-\sqrt{100}</math>    D. <math>\pi</math></p> <p>E. 0              F. <math>2\frac{1}{6}</math></p> <p>G. -5             H. 4.03</p> <p>I. <math>-\sqrt{72}</math>        J. <math>\sqrt{\frac{4}{9}}</math></p> <p>K. <math>\frac{36}{9}</math></p>	
--	--

## Properties

Identify the property shown below.

7. $4 + (x + y) = (4 + x) + y$ Associative	8. $\frac{2}{5} \cdot \frac{5}{2} = 1$ <del>Commutative</del> Inverse
9. if $\sqrt{49} = 7$ and $7 = 3 + 4$ , then $\sqrt{49} = 3 + 4$ Transitive	10. $-28 = -28$ Reflexive
11. $8x^2 \cdot 1 = 8x^2$ Identity	12. $10y + (-10y) = 0$ Inverse
13. $(a + 4) \cdot 0 = 0$ Zero Product	14. $-5(x + 7) = -5x - 35$ Distributive
15. $(x + 2) + y = (2 + x) + y$ Commutative	16. if $x = -1$ , then $-1 = x$ Symmetry

Answer True or False. Provide an example if false.

17. The set of negative numbers are closed under division.

$$\frac{-3}{-2} = 1.5 \leftarrow \text{not negative}$$

18. The set of whole numbers closed under subtraction.

~~20-10~~  
 $4-5 = -1 \leftarrow \text{not whole}$

19. The set of integers are closed under multiplication.

True

**Absolute Value & Order of Operations**

<p>20. <math> -21  +  5 </math>  <math>21 + 5</math>  <span style="border: 1px solid black; padding: 2px;">26</span></p>	<p>21. <math> -10 - 4 </math>  <math> -14 </math>  <span style="border: 1px solid black; padding: 2px;">14</span></p>
<p>22. <math>10 - 2 \cdot 3^2 + 13</math>  <math>10 - 2 \cdot 9 + 13</math>  <math>10 - 18 + 13</math>  <span style="border: 1px solid black; padding: 2px;">5</span></p>	<p>23. <math>[(-5+1) \div 2]^3 -  -7 </math>  <math>[(-4) \div 2]^3 - 7</math>  <math>(-2)^3 - 7</math>  <math>-8 - 7</math>  <span style="border: 1px solid black; padding: 2px;">-15</span></p>
<p>24. <math>\frac{25+5^2 \div 5}{7-12 \div 4+2}</math>    <math>\frac{25+25 \div 5}{7-12 \div 4+2}</math>  <math>\frac{25+5}{7-3+2} = \frac{30}{6} =</math> <span style="border: 1px solid black; padding: 2px;">5</span></p>	<p>25. <math>\frac{(3-7)^2+11}{ -2 + -1 }</math>    <del>(20)</del> <math>\frac{(-4)^2+11}{2+1}</math>  <math>\frac{16+11}{3} = \frac{27}{3} =</math> <span style="border: 1px solid black; padding: 2px;">9</span></p>

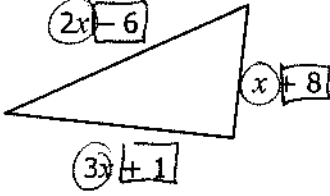
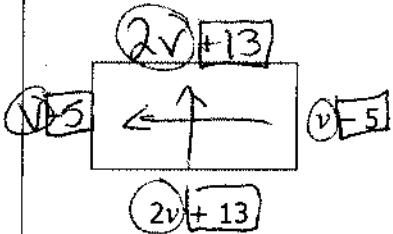
**Evaluating Expressions**

<p>26. <math>3x^3 - 8y^2</math> if <math>x = 2</math> and <math>y = -3</math>  <math>3(2)^3 - 8(-3)^2</math>  <math>3(8) - 8(9)</math>  <math>24 - 72</math>  <span style="border: 1px solid black; padding: 2px;">-48</span></p>	<p>27. <math> a - 4b </math> if <math>a = 7</math> and <math>b = 2</math>  <math> 7 - 4(2) </math>  <math> 7 - 8 </math>  <math> -1  =</math> <span style="border: 1px solid black; padding: 2px;">1</span></p>
<p>28. <math>w^2 + 2xy</math> if <math>x = -3</math>, <math>w = -2</math>, and <math>y = 1</math>  <math>(-2)^2 + 2(-3)(-2)</math>  <math>4 + -12 =</math> <span style="border: 1px solid black; padding: 2px;">-8</span></p>	<p>29. <math>\frac{7c^2+5}{4a-b}</math> if <math>a = 1</math>, <math>b = -5</math> and <math>c = -4</math>  <math>\frac{7(-4)^2+5}{4(1)-(-5)}</math>    <math>\frac{(7)(-16)+5}{4+5}</math>  <math>\frac{112+5}{4(1)-(-5)}</math>    <math>\frac{117}{9} =</math> <span style="border: 1px solid black; padding: 2px;">13</span></p>

### Translating Expressions, Equations, & Inequalities

<p>30. "The product of a number and 7, increased by three."</p> $7n + 3$	<p>31. "One less than twice a number"</p> $2n - 1$
<p>32. "Four times the difference of a number and nine is -30."</p> $4(n - 9) = -30$	<p>33. "Five more than the quotient of a number and eight is 42."</p> $5 + \frac{n}{8} = 42$
<p>34. "The schola can hold a maximum of 150 people."</p> $S \leq 150$	<p>35. "You must be at least 25 to rent a car."</p> $P \geq 25$

### Simplifying Expressions

<p>36. <math>n + 4 - 9 = 5n</math></p> $-4n - 5$	<p>37. <math>7x - 4y - 8 - 3x - 8y + 12</math></p> $4x - 12y + 4$
<p>38. <math>18 - 2(4x + 7) + 5x</math></p> $18 - 8x - 14 + 5x$ $-3x + 4$	<p>39. <math>9(x - 3) - (x + 2)</math></p> $9x - 27 - x - 2$ $8x - 29$
<p>40. Write the perimeter of the triangle in simplest form.</p>  $6x + 3$	<p>41. Write the perimeter of the rectangle in simplest form.</p>  $6v + 16$

### Two-Step Equations

<p>42. <math>3x - 7 = 11</math></p> $+7 +7$ $\frac{3x}{3} = \frac{18}{3}$ $x = 6$	<p>43. <math>\frac{x}{4} + 8 = 3</math></p> $-8 -8$ $\left(\frac{4}{1}\right) \frac{x}{4} = -5 \left(\frac{4}{1}\right)$ $x = -20$
---	--